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July 27, 1999

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Magalie Roman Salas, Secretary
Office of the Secretary
Federal Communications Commission
The Portals
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: Written Ex Parte Presentation in CC Docket Nos. 95-185, 96-98

Dear Secretary Salas:

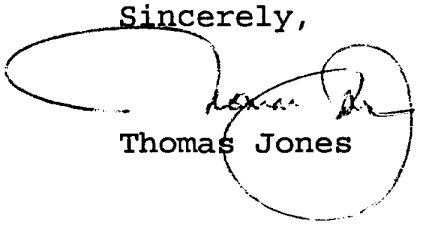
On behalf of Time Warner Telecom Holdings Inc. d/b/a Time Warner Telecom ("TWTC"), I am hereby filing two documents in response to Commission staff information requests.

The first document is a detailed description of the service problems TWTC experienced with its third-party Signaling System 7 ("SS7") vendor. As this description demonstrates, TWTC would be impaired in its ability to provide competitive local telecommunications service if SS7 were not available as an unbundled network element.

The second document is an analysis of the relative costs TWTC would incur if it were to (1) resume purchasing directory assistance ("DA") from the third-party vendor it used until recently, (2) continue to purchase DA from incumbent LECs, as it does now, or (3) self-provision DA. The cost analysis demonstrates that for the foreseeable future the relative costs TWTC would incur in purchasing DA from a third-party vendor or in self-provisioning DA are several times that of purchasing DA from the incumbent LECs. It is clear, therefore, that TWTC would be impaired in its ability to provide competitive local telecommunications service if DA were not available as an unbundled network element.

Pursuant to Section 1.1206(b)(1) of the Commission's rules, I am filing two copies of this letter and the attachments in the above-referenced docketed proceedings.

Sincerely,



Thomas Jones

Attachments

cc: Jake Jennings
Claudia Fox
Anthony Mastando
Sanford Williams

Problems Time Warner Telecom Experienced With Its Third-Party Signaling Vendor; Ex Parte Communication in CC Docket Nos. 95-185, 96-98

This submission provides a description of specific service problems that Time Warner Telecom ("TWTC") experienced with the third-party Signaling System 7 ("SS7") vendor it used between 1996 and 1998. As explained in the reply comments TWTC filed in the above-referenced proceedings, the most serious technical problems with the third-party vendor's signaling network were that (1) in contrast to the ILECs' fully diverse SS7 link networks, the vendor failed to ensure that its network of A-Links and B-Links[1] contained adequate route diversity, and (2) too many TWTC switches were served by too few vendor STPs; more of TWTC's network was therefore harmed when one of the vendor's STP pairs experienced problems than would have been the case with the ILECs, whose SS7 networks have many more STP pairs. In addition, as a general matter, the vendor was apparently unable to attract personnel with adequate skill and experience to run a reliable wholesale SS7 operation.

Given the shortcomings of the third-party vendor as compared to the ILECs, TWTC determined that it would be impaired in its ability to provide local telecommunications services at a competitive level if it continued to rely on the vendor in question. Moreover, TWTC was unable to find another third-party vendor that could meet TWTC's SS7 needs. TWTC was therefore forced to begin purchasing its SS7 service from the ILECs. Since switching to the ILEC service, TWTC has experienced fewer and less serious problems in its SS7 service.

TWTC first experienced problems with the service provided by its SS7 vendor at the end of 1996. On November 16, 1996, the SS7 vendor suffered a fiber cut in B-Links connecting two STP pairs. The fiber cut caused the vendor's SS7 network to block Integrated Switched Digital Network User Part ("ISUP") (call set-up) messages originating at TWTC's Memphis switch. In other words, during the service outage, no call originating at a line served by the Memphis switch and terminating at a line served by another switch could be completed. The service outage lasted for approximately seven and a half hours.

The B-Links in question were leased by the vendor from a subcontracting carrier. As a result of the fiber cut, 132 DS3s in the subcontracting carrier's network went out of service at

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[1] A-Links connect switches, in this case TWTC's switch, to Signal Transfer Points ("STPs"). B-Links connect STPs.

10:20 a.m. on November 16. Within 8 minutes of the fiber cut, 93 of the DS3s were automatically rerouted. The remaining 39 DS3s were manually rerouted throughout the morning and afternoon. By 3:30 p.m., all DS3s had been restored.

However, TWTC's signaling services still could not be restored. Two of the subcontractor's links that had been rerouted (in response to the fiber cut), only had one-way transmission. This limitation in combination with retransmissions that resulted from the limited one-way transmission capability had been causing the subcontractor's STP to experience congestion. Congestion, in turn, prevented TWTC's ISUP messages from passing from its Memphis switch to other switches. After the one-way links were again rerouted, ISUP service was finally restored at 5:40 p.m.

An SS7 network with adequate route diversity in its network of links between STPs would not have experienced a service outage as a result of a single fiber cut. Instead, messages would simply have been rerouted over links that were not cut. However, TWTC discovered after the November 1996 outage that its SS7 vendor had failed to ensure that its subcontractor deployed adequate diversity. Specifically, the subcontractor's B-Link quad between STPs had only a single route. Bellcore (now Telcordia) standards require three-way diversity.

On or around December 27, 1996, just a little over one month after the November incident, TWTC discovered that one of the vendor's STPs was not performing Custom Local Areas Signaling Services ("CLASS") feature functions (e.g., Automatic Redial and Last Call Return). TWTC brought this problem to the vendor's attention on December 27, 1996. The vendor, however, did not open a trouble ticket until December 31. Moreover, it was not until two and a half months later, on January 27, 1997, that the source of the problem was identified (as an incorrect translation code in the STP) and fixed.

Nor were the problems limited solely to the vendor's network. At the end of 1996, the vendor performed an audit of the bills it had sent TWTC during the 1996 calendar year. The vendor determined that there were charges for interexchange signaling, local signaling, and trunk signaling for which TWTC had never been billed. While the vendor apologized for the oversight, its inaccurate bills offered yet another example of its inability to provide reliable service.

Unfortunately, the problems suffered by TWTC got more severe as time passed. The most harmful example occurred in October of 1997. During this incident, seven of TWTC's switches lost SS7

service. The outage varied in length from just over two hours in Rochester to over five and a half hours in Memphis and Raleigh. These outages caused TWTC customers to lose service and seriously damaged TWTC's reputation for high-quality, reliable service.

The incident began on the evening of October 26, 1997. At that time, one of the two entrance facilities into one of the vendor's STPs ("STP-A") started to experience sporadic service interruptions (this affected two T1s). Technicians from the vendor and facility supplier were dispatched to address the problem. Later that evening and then early in the morning of October 27, 1997, all 19 T1s in the network began to experience intermittent failures lasting between one and two minutes. In response to these intermittent failures, the vendor's STPs began issuing an excessive number of SS7 management messages for the automatic rerouting of SS7 traffic to the mate of STP-A ("STP-B"). These messages contained a large amount of data and significantly increased traffic on the network. Moreover, for unrelated reasons, the SS7 network was already experiencing unusually high traffic volumes.

At approximately 7:00 a.m. on October 27, four of the 19 T1s in the vendor's network started to experience frequent failures lasting between one and two minutes. As a result, STP-A, consistent with industry standards, took out of service the SS7 links in the four T1s. The traffic carried over these links was automatically rerouted to STP-B. This added even more traffic to STP-B. STP-A and STP-B then misinterpreted the network management messages and, inappropriately, shut down two of the STP pairs in the vendor's SS7 network.

At 9:00 a.m., the vendor's STP manufacturer began working on restoring connectivity at the STPs that had been shut down. At 9:40 a.m., all 19 T1s came back into service. Apparently, one of the power supply cards on the network had been defective and, once replaced, the T1s functioned properly. After restoration of the 19 T1s, TWTC's 800 service was restored, some SS7 links began functioning and some of the SS7 network congestion was eliminated. Nevertheless, the two STP pairs that had been cut off remained out of service. At approximately 1:00 p.m., the manufacturer made switch modifications at STP-A and STP-B that compensated for the incorrect processing of the network management messages. All STPs were then restored to full service.

The consequences of the problems experienced in October 1997 were made much more serious for TWTC because so many of TWTC's switches were served by the STP pairs that shut down. If TWTC had been using ILEC SS7 service, each TWTC switch would have been

served by a separate STP pair. Thus, all other things equal, many of the switches that experienced service outages in October 1997 would have been unaffected had TWTC been using ILEC SS7.

In addition to these specific problems, TWTC experienced other serious ongoing problems with its vendor that, despite TWTC's repeated complaints, were never fixed. For example, the vendor's A-Links periodically "bounced." That is, they randomly took themselves out of service. In addition, the vendor was chronically unable to meet deadlines to enable TWTC to turn on a switch in a new market or to establish a new interconnection with another carrier's switch. For example, the vendor was constantly missing deadlines for establishing Point Code Routing, which allows the SS7 network to recognize and communicate with a new switch. The vendor was also unable to meet agreed-upon deadlines in new switch A-Link turn-ups. As a result of these problems, TWTC was forced to delay turning up its switch in virtually every single new city it entered while TWTC was served by the third-party vendor.

In sum, TWTC simply could not rely on the third-party vendor it used between 1996 and 1998. While TWTC prefers not to purchase essential inputs of production from ILECs, the absence of reliable third-party vendors that could meet TWTC's needs and quality standards made it necessary for TWTC to purchase SS7 from the ILECs. It does seem likely that a functioning wholesale SS7 market will eventually develop. Once viable third-party alternatives are available, TWTC will again explore using a third-party vendor. Until that time, however, it is clear that TWTC would be impaired in its ability to provide competitive local service if ILECs were not required to provide SS7 as an unbundled network element.

Time Warner Telecom Directory Assistance Cost Estimates
Ex Parte Communication in CC Docket Nos. 95-185, 96-98

Average Cost Per Call Using Incumbent LECs' DA Platform[1]	$0.40
Average Cost Per Call Using Third-Party Vendor Platform[2]	$1.19
Average Cost Per Call Using a TWTC DA Platform (See Below)	$3.00 to $4.00

Estimated Costs of Constructing and Operating a Single National Call Center

Capital Costs[3]	$4,312,000
Start-Up Costs[4]	$1,517,940
Total One-Time Costs	$5,829,940
Annual Operating Costs[5]	$1,184,000

Annual Messages
604,776/yr (16 cities)[6]

Cost per Call

10-Year Amortization (($5,829,940/10) + $1,184,000)/604,776 = $2.92/call

7-Year Amortization (($5,829,940/7) + $1,184,000)/604,776 = $3.33/call

5-Year Amortization (($5,829,940/5) + $1,184,000)/604,776 = $3.88/call

Even extending the recovery of capital and start-up costs to 15 years and doubling the number of calls would produce an average cost per call of approximately $1.30, or over three times the average cost utilizing the incumbent LEC DA platform.

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[1] Includes the cost of ILEC wholesale DA charges plus transport to ILEC call centers.
[2] Includes the cost of vendor's DA charges plus transport to single national call center.
[3] Capital costs include the costs of purchasing a switch and building construction, call center building construction, and operator equipment.
[4] Start-up costs include technical/engineering costs, Management Information System (MIS) costs, operator training, and establishment of a listings database.
[5] Operating costs include building lease, operator salary, trunking from end-office switches, and daily/weekly listings downloads.
[6] Based on TWTC's DA call data for July and August 1998 in 9 cities.